

ERGONOMICS STANDARDS

Thousands of ergonomics standards exist, but most address problems in manufacturing, trucking, and warehousing. Standards that apply to offices and libraries are still few in number. The most important standards are either drafts or voluntary.

Standards may be national, state, or international. The most numerous are voluntary international standards; the mandatory ones tend to be state standards. The mandatory U.S. national standard issued by OSHA in 2000 was overturned by Congress in 2001; the voluntary U.S. national standard is still in draft form. There are mandatory national standards in most European countries. Voluntary standards and draft standards are important because you can use them as guidelines or to identify ergonomic products by ascertaining whether they conform to published standards.

U.S. National Standards

The most comprehensive ergonomic standard ever developed in the United States that is appropriate for offices and libraries was developed by OSHA and adopted by the Clinton Administration near the end of its second term. The standard was overturned by the U.S. Congress in March 2001, but remains a useful guide for organizations that wish to establish a voluntary program.

A new ergonomic standard such as that scrapped by Congress will not likely be adopted in the next several years because the Congressional Review Act of 1996 was used as the basis for the action. The act bans any substantially similar regulation from replacing the one rejected.

Occupational Safety and Health Administration (OSHA)

OSHA historically focused on manufacturing jobs. Despite much opposition from manufacturers, Congressional concern about serious injuries in response to lobbying by unions resulted in the creation of OSHA in the 1970s. Beginning in 1990, OSHA sought to expand its standards to include manual handling jobs and jobs with a history of MSDs. The former are jobs in which employees perform forceful lifting and lowering, pushing and pulling, or carrying. The latter are any jobs in which employees reported an MSD.

The OSHA standard consisted of a comprehensive program of six elements. For establishments that had not experienced an OSHA-recordable MSD, the basic program entailed only the first two of these elements:

1. Management leadership and employee participation

Managers must be informed that they have a responsibility to protect their workers. Employees must have a means to report problems and must be involved in hazard analysis and control. Someone in the organization must be designated to respond to problems.

MSDs are musculoskeletal disorders.

A great deal of ergonomics information is available at OSHA's Web site: www.osha.gov, including the draft standard. The full-text of the draft standard on the Web is hard to find because the URL has changed several times.

At press time, the URL was [www.osha-slc.gov/ergonomics-standard/PROPOSED/preamble/XVIII_Reg\)Text.html](http://www.osha-slc.gov/ergonomics-standard/PROPOSED/preamble/XVIII_Reg)Text.html).

2. Hazard identification and information

Records must be kept on all reports of signs and symptoms of MSD. Reports must be reviewed for indications of hazards and employees must be informed of hazards. Two screening criteria were required to consider a hazard as subject to the standard.

- a. The physical work activities and conditions in the job are reasonably likely to cause or contribute to the type of MSD reported.
- b. These activities and conditions are a core element of the job or make up a significant part of the job.

3. Job hazards analysis

Problem jobs must be analyzed and MSD hazards eliminated or controlled to the extent feasible. Jobs that are similar to the problem job must also be analyzed, and the ergonomics program extended to cover them. Engineering controls are preferred, followed by work practice and administrative controls. Engineering controls include modifications in workstations, tools, equipment, materials, or processes. Administrative controls include employee rotation, changing the task, or changing the pace. The definition of work practice controls is procedures and methods for safe work, such as training in proper posture or employer-authorized micro breaks.

4. Training

Employees in problem jobs and their supervisors must receive training at least every three years. The training must include common MSD hazards, the signs and symptoms of MSDs, the importance of reporting them early, how to report MSD signs and symptoms, and a summary of the requirements of the standard.

5. MSD management

Any employee with an MSD must be provided with access to prompt and effective evaluation, treatment, and follow-up by health care providers. MSD management also includes any work restrictions recommended by health care providers. All must be provided at no cost to the employee.

6. Program evaluation

The program must be evaluated at least every three years.

The standard was developed from a study of best practices in organizations that have well established ergonomics programs. More than 10 years of data gathering, analysis, and discussion went into creating the standard. The major objections voiced by those opposed were that it would cost too much money to analyze job hazards, train employees, establish that injuries were real and actually work-related, and pay for treatment.

The response to the documentation of savings realized as the result of ergonomics programs in organizations that established theirs before the OSHA standard's completion was that each organization should be able to determine for itself whether it would realize savings. It was argued that the existence of a voluntary standard developed by the National Safety Council (NSC) was reason to reject the OSHA standard. The NSC standard, however, was still in draft form when the government elected not to adopt the proposed OSHA requirements.

American National Standards Institute (ANSI)

ANSI is a private organization that oversees the development of standards by consensus within industries. It has no enforcement power. Many standards adopted and enforced by OSHA when it was founded in the 1970s were developed by ANSI. The most important ergonomics standard developed by ANSI in the past decade is ANSI Z.365—Control of Cumulative Trauma Disorders (formerly Management of Work-Related Musculoskeletal Disorders). The development effort was under the auspices of the National Safety Council, an ANSI-accredited standard development body.

ANSI Z.365 is limited to MSDs of the upper body. It is primarily aimed at office workers. Hotel, grocery, warehousing, and trucking companies lobbied hard to remove all types of lower back injuries common in their industries from the standard. Unions are now attempting to incorporate elements of ANSI Z.365 into their labor agreements.

The first working draft took five years to develop, and it has already taken another five years of effort to reconcile negative votes. The major objections to the first version circulated for comment in 1998 were the scope of the standard and the definition of *work-related*. The second version circulated at the end of 2000 was attacked by the Food Marketing Institute with the argument that “there is no consensus on the science of ergonomics and its impact on musculoskeletal disorders.” The standard had not yet been adopted and published at the time this report went to press.

ANSI Z.365 is intended as a guide for managers and occupational safety and health professionals to voluntarily keep workers safe from work-related MSDs. It is already being used that way by hundreds of organizations.

Americans with Disabilities Act (ADA)

The ADA contains many requirements of employers to enable physically challenged employees to work more easily. Although most of the requirements affect hiring practices, some concern ergonomics. For example, aisles must be wide enough to accommodate wheelchairs; tables and desks must allow a wheelchair to come close enough to work at them; and computer keyboards and screens must use adaptive technology.

State Standards

Many states have adopted ergonomics standards or programs:

California

California adopted the first state standard in 1997. The standard requires corporations to undertake an assessment, identify solutions, and begin ergonomic training programs if two employees in an organization employing at least 10 people who perform identical work activities sustain similar repetitive stress injuries.

ANSI's Web site is at www.ansi.org, however, the text of ANSI Z 365 is not available at that site. The site of the National Safety Council (www.nsc.org) has more ergonomics information than ANSI's, but it also does not have the text of the latest draft. The best way to access information is to search the Internet using the search term ANSI Z.365.

Information is available at www.dir.ca.gov/title8/5110.

Oregon

Early in 1996 the state of Oregon launched a program providing grants to develop “innovative solutions to intractable ergonomic problems, offering grants to employers seeking to resolve persistent ergonomic problems resulting in injuries and workers’ compensation claims.” The model programs might then be the basis for similar companies and organizations. Among the success stories is an effort by the City of Portland, which dramatically reduced MSDs among its 8,000 full- and part-time employees.

Washington

The Washington State Department of Labor and Industries adopted an ergonomics rule in 2000. The rule was designed to reduce workplace hazards by requiring employers to evaluate jobs to identify potential economic risks such as awkward, heavy lifting, or highly repetitive motion. Employers must reduce employee exposure when these jobs are hazardous. Employers also must provide basic ergonomics education for employees who work in or supervise risky jobs.

Initially, the rule will focus on larger employers (50 or more) in the 12 industries with the highest risk of ergonomics injury. They will have until July 1, 2002, to complete a hazard analysis and educate workers. Employers in these industries will have an additional year to achieve hazard reductions. By 2005, the rule will cover all work sites in the state with at least one full-time employee.

Information is available at
www.ini.wa.gov/wisha/ergo.

International Standards

The most comprehensive set of standards are the international standards developed by the International Organization for Standards (ISO). These are voluntary standards except as they have been adopted as mandatory national standards by a number of countries. The European Union has a number of mandatory standards, many of them based on ISO standards.

International Organization for Standardization (ISO)

The International Organization for Standardization has developed 36 separate ergonomics standards, including 15 related to the use of monitors in an office environment. These standards form an entire chapter, Chapter 13.180, in ISO standards manuals. Many monitor manufacturers’ specification sheets indicate conformity with these standards.

One of the most important standards is ISO 9241, a standard for the design and use of computer monitors. A British standard, designated BS EN 29241, is based on the ISO standard but is even more extensive. It covers not only the monitor, but also the keyboard, the workstation, chair, space requirements, lighting, reflections and glare, noise, heat, and humidity.

Other European countries have also adopted the ISO standard as the basis for their national standards. Scores of available monitors are, there-

The Web address for the
ISO is www.iso.ch.

fore, ISO 9141-compliant.

Other important ISO standards are ISO 8995, a standard for the lighting of indoor work systems, and ISO 11226, the evaluation of static working postures.

European Union

Directive 90/270/EEC constitutes the health and safety requirements for working with display screen equipment.

One of the basic requirements is that the refresh rate has to be such that flicker is reduced. Flicker, which is uncomfortable for the human eye, tends to disappear as the refresh rate increases, but if the refresh rate is too fast, image quality is adversely affected. The directive also requires that the brightness or the contrast between the characters and the background is easily adjustable by the operator.

The regulation covers not only the workstation but also the immediate surrounding area. One of the minimum requirements states that "the screen must swivel and tilt easily and freely to suit the needs of the operator." The directive further provides that if the means are not built in, a swivel must be provided as part of the desk furniture or by a screen support device. Problems of glare, noise, heat, and humidity are also addressed.

The directive also requires that those working with a computer monitor have their work periodically interrupted by breaks or changes of activity.

The member states are required to implement the directive with appropriate domestic legislation.

TCO Development Unit

For a number of years, the Swedish Confederation of Professional Employees has maintained a unit for the development and promotion of a standard for computer monitors. The confederation issued its first standard in 1995. The current revised standard, designated TCO'99, requires high image refresh rates to entirely eliminate perceived flickering, substantial reductions in magnetic and electric fields, reduced heat emissions to keep humidity constant, no effects on the displayed image by external magnetic fields, and reduced energy consumption. Many LCD-based flat panel monitors are TCO '99-certified, as are some CRT (cathode ray tube)-based monitors, in particular those of Nokia and ViewSonic.

The English-language text is at http://europa.eu.int/eur-lex/en/lif/dat/1990/en_390L0270.html.

The **refresh rate** is the rate at which the complete screen is redrawn.

Flicker is the change in the phosphors used to paint the screen.

TCO is (in Swedish) the Swedish Confederation of Professional Employees).

The Society's Web site is in Swedish. For information in English, go to www.tco.se/eng.